UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/623,268	08/30/2000	Frank Filser	00-497	1826

34704 7590 06/28/2007

BACHMAN & LAPOINTE, P.C.
900 CHAPEL STREET
SUITE 1201
NEW HAVEN, CT 06510

EXAMINER	
LAZORCIK, JASON L	

ART UNIT	PAPER NUMBER
1731	

MAIL DATE	DELIVERY MODE
06/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/623,268
Filing Date: August 30, 2000
Appellant(s): FILSER ET AL.

Mr. G. Lapointe (Reg. No. 28,395)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 22, 2007 appealing from the Office action mailed July 21, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is essentially correct – equation (1) on page 3 of the Brief should contain a cube root symbol ($\sqrt{}$).

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,106,747	Wohlwend	8-2000

Halloran, J.W., Apellants' Exhibit A - "The John Halloran Letter" dated April 6, 2004, submitted by Appellants on May 3, 2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 16-34 and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wohlwend (US 6,106,747) in view of Applicant's Exhibit A: the John Halloran letter dated 6 April 2004 (supplied to the PTO in the response of 5/3/2004).

Wohlwend teaches (Column 1, lines 55-65) a method for forming dental prostheses having precise dimensions. In general, the reference teaches that a form for the prosthetic is "profiled" from a prepared block of material by cutting the desired shape in enlarged dimensions to "compensate for shrinkage during sintering". This enlarged form is subsequently sintered to the density and hardness required for the end use application.

The specific process disclosed by Wohlwend (Column 3, lines 24-42 and Column 4, lines 51-54) includes the steps of:

1. Scanning and digitizing the dimensions of a positive model of a skeletal structure (Column 2, Lines 34-38);
2. Enlarging the dimensions of the model by "the appropriate enlargement factor" (Column 2, lines 40-43);
3. Transferring the enlarged dimensions to a porous ceramic blank via material removal (Column 2, Lines 40-42);
4. Dense sintering the blank; and (Column 1, Lines 63-65, Claim 1,and Claim 7)
5. Facing the blank with a coating material (Column 4, lines 48-58).

Although Wohlwend does not explicitly teach "linearly" enlarging the dimensions "in all directions" as claimed, the reference does disclose applying the enlargement factor to the digitized prosthetic dimensions in order to "compensate for shrinkage during sintering". One of ordinary skill in the art equipped with the Wohlwend teachings would either find the linear compensation an implicit component of the instant reference or would alternatively recognize said "linear" enlargement "in all directions" as a merely obvious extension over the prior art.

Wohlwend does not explicitly limit the enlargement factor to conform the formula presented in Claims 16, 32, and 33.

It is instructive here to examine the Applicants enlargement factor to understand its intuitive and obvious mathematical basis. First Applicant teaches a material density prior to sintering, ρr or "the relative density, and a post-sintering density, ρs or "the achievable relative density". Assuming conservation of mass, the fraction $\rho s/\rho r$ is simply a mathematical representation for fractional volume shrinkage for the ceramic body from the pre-sintering stage to the post-sintering stage. The cube root of the volume ratio merely reduces the volumetric contraction ($\rho s/\rho r$) into a linear vector quantity which one of ordinary skill would recognize an obvious and natural form for scaling a digital representation (read x,y,z coordinates) of a volumetric body. Restated, although Wohlwend does not explicitly set forth the details of Applicants claimed enlargement

factor, said enlargement factor details appear on their face to merely state an obvious solution to the enlargement operation contemplated and disclosed by Wohlwend.

The Halloran letter teaches the level of ordinary skill in the art at the time of the invention with respect to ceramic shrinkage during sintering and specifically the ordinary level of skill with respect to the "enlargement factor". To this end, Halloran explicitly states;

a. Ceramic engineers *routinely consider the shrinkage during fabrication*...moulds, tools, CAD dims, etc. are routinely made larger by "enlargement factors"...*This is a normal part of the ceramic art*, and *need not be specified in detail*.
b. Also well known in the art...the *enlargement factor is computed from starting density and sintered density*.
c. *It is commonly understood* that the reproducibility of the dimensions of the finished ceramic article depends upon the starting density, so *efforts are made to control this factor as part of the ordinary practice of ceramic manufacture*.

In short, Halloran teaches that it is a merely routine operation for a skilled ceramic engineer to compute enlargement factors by taking into account the starting density ("relative density") and final density ("achievable relative density") of a ceramic material. Further, one having an ordinary level of skill in the art would necessarily undertake steps to "control" the precision (e.g. calculating f to 4 decimal places) of the enlargement factor as a routine quality control measure to insure "the reproducibility of the dimensions of the finished ceramic article". Finally and most importantly, Halloran instructs that the calculation of "enlargement factors" are such a trivial matter and so notoriously well known in the art that they "need not be specified in detail".

Therefore, although Wohlwend may not specify the particular details of the enlargement factor as claimed by Applicant, the Halloran letter teaches that the claimed enlargement factor is a merely obvious extension over the prior art. Specifically, Halloran discloses that calculation of the enlargement factor is a "normal part of the ceramic art" and "need not be specified in detail". It follows that Applicants explicit rendering of these calculation details is insufficient to patentably distinguish the claimed invention over method disclosed in the prior art.

(10) Response to Argument

Applicant argues that the specification, previously held as non-enabling due to the term "the achievable relative density after sintering", can not now be rendered obvious by prior art patent to Wohlwend since Applicant asserts the reference was previously considered and withdrawn. With respect to the Halloran letter – Exhibit A, Applicant asserts that "it is hard to believe that a letter which states that the instant application has sufficient disclosure to enable one to make and use the invention described can be said to raise a new ground of rejection".

Examiner disagrees with this argument.

Applicant is reminded that the Halloran Letter - Exhibit A was originally pointed to by Applicant in order to show that "the term "achievable relative density"... is clear and readily attainable to one skilled in the art when viewing the instant specification"

(see pg 13/18, lines 10 to 13 of Applicants remarks submitted May 3, 2004). The issue currently at hand, namely whether the details of Applicants claimed "enlargement factor" patentably distinguish the claimed invention over the prior art, is separate and distinct from the question of enablement for the term "achievable relative density". Although the Wohlwend reference was previously removed as prior art, its reconsideration and reapplication in view of the Halloran Letter is in fact proper.

Applicant argues that "our procedure is much simpler than Wolhwend's", citing several alleged differences between the claimed invention and that of prior art. Applicant further argues that "Wohlwend doesn't teach anything to what density is being sintered" and "Wohlwend offers no teachings and therefore can't guarantee for any dimensional accuracy after sintering". To this end, Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Applicant argues that a final sintering step was not mentioned in any previous Office Action nor does the reference to Wohlwend mention sintering the enlarged framework to final dimensions. Examiner strongly disagrees. As clearly pointed out in the Office Action dated March 14, 2002, the Examiner clearly indicated (see Page

5) that Wohlwend teaches a step of "dense sintering the blank". Applicant is further pointed to the Wohlwend reference Column 1, Lines 63-65, Claim 1,and Claim 7.

Applicant argues the following points:

- Wohlwend never linked the shrinkage to density
- The enlargement factor is not disclosed by Wohlwend
- Wohlwend doesn't give any hint on how to determine an enlargement factor
- Wohlwend does not teach how to apply the enlargement factor
- Wohlwend never teaches "the type of enlargement that he intends to use"
- Wohlwend never teaches "determination of an enlargement factor according to the special blank"

In response to applicant's arguments against the Wohlwend reference individually, Applicant is respectfully reminded that the rejection of the claims under consideration is based on the combination of prior art references to Wohlwend in view of the Halloran letter under 35 U.S.C. 103(a). Therefore, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Wohlwend never teaches what final density his forms and working stump and pack are sintered to. Examiner disagrees. Wohlwend teaches that "the density and hardness of the material necessary for its use as a dental

prosthesis are achieved ... after resintering" (Column 1, lines 63-66). It is clear from this disclosure that Wohlwend contemplated sintering to "an achievable relative density" and that this value would have been obvious to one of ordinary skill particularly in view of the Halloran letter. Specifically, Halloran states that "It is commonplace to choose sintering conditions to achieve the desired sintered density...The factors which influence the achievable relative density so well-known to the ceramic engineer that it is unnecessary to specify them." Halloran continues by asserting that "the density after sintering varies with the powder, the chemical composition, and the sintering conditions...The sintered density ...varies from a pore-free state (theoretical density to any chosen degree of residual porosity or relative density."

Applicant argues that Halloran doesn't specify how to calculate the enlargement actor from initial and final densities and enlarge linearly. Examiner strongly disagrees. Halloran explicitly states that it is "well known in the art...the *enlargement factor is computed from starting density and sintered density*." Further, Halloran explicitly states that the details of the enlargement factor are so notoriously well known and routinely utilized in the ceramic arts that they need not be relayed in detail.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Jason L. Lazorcik

STEVEN P. GRIFFIN
PRIMARY EXAMINER
AU 1731

Conferees:

Steven Griffin

Patrick Ryan